

In re Application of: Wiley
Application Serial No.: 10/723,028

REMARKS

Currently claims 31 are pending in the present application, of which claims 1, 7, 8, 12, 17, 23, 30 and 31 are independent claims. Each of the independent claims has been amended for clarity.

Rejections Under 35 USC §102(e) to Carpenter

The office action rejects claims 1-4, 6-11, 17-20, 22-29 and 30 under 35 USC 102(e) as being anticipated by US Patent 6,857,293 to Carpenter ("Carpenter").

Specifically, the office action asserts that Carpenter teaches each element of claim 1, specifically citing its Abstract. Claim 1 has been amended to clarify its distinctiveness, and is reproduced below:

1. A method of increasing the photosensitivity of hydrogen-loaded optical fibers, the method comprising the steps of:
 - A. providing at least one hydrogen-loaded optical fiber having a cladding and a core; and
 - B. relocating hydrogen atoms disposed within the optical fiber from the proximity of the cladding to the proximity of the core, said relocating comprising:
 - i) generating a temperature gradient between the cladding and the core by applying at least one burst of a fluid heated to a temperature of at least about 100°C to the cladding of the at least one optical fiber.

For a claim to be invalid under §102, the reference must teach the identical invention. Specifically, the Federal Circuit has held that:

The identical invention must be shown in as complete detail as is contained in the ... claim.

Richardson v. Suzuki Motor Co., 868 F.2d 1226,
1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)

Furthermore, to be invalid under §102 every element of the claim must be anticipated by a prior art reference. The Federal Circuit has also specifically held that:

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.

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Verdegaal Bros. v. Union Oil Co. of California, 814
F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)

Attachment I hereto provides a comparative summary of some of the many distinctions of the claim 1 over Carpenter. Considering the many distinctions highlighted in the attachment between claim 1 and Carpenter – it seems clear that Carpenter does not disclose the “identical invention” or “each and every element” of claim 1. Specifically element B of claim 1 is discussed below.

Claim 1, Element B

B. relocating hydrogen atoms disposed within the optical fiber from the proximity of the cladding to the proximity of the core, said relocating comprising:

Carpenter does not teach, identically and in complete detail as required for a rejection under §102, relocating hydrogen within a fiber that is already hydrogen loaded. Instead, Carpenter teaches taking a fiber that has no hydrogen and then loading it with hydrogen (or diffusing hydrogen into it). It is generally known that loading a fiber with hydrogen increases its photosensitivity for writing gratings – the present invention goes beyond that. But Carpenter does not. Carpenter merely provides a better way of loading the fiber with hydrogen. Thus, Carpenter provides (presumably) a better way to produce a hydrogen loaded fiber, something presumed to exist in element A of claim 1. Carpenter offers no teachings regarding relocating the hydrogen in an already hydrogen loaded fiber – as in element B of claim 1.

Claim 1, Element B, sub i)

i) generating a temperature gradient between the cladding and the core by applying at least one burst of a fluid heated to a temperature of at least about 100°C to the cladding of the at least one optical fiber.

Carpenter does not teach, identically and in complete detail as required for a rejection under §102, generating a temperature gradient (particularly for relocating hydrogen within a

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hydrogen loaded fiber). As shown in attachment A, Carpenter places a portion of a fiber within a sealed chamber filled with pressurized hydrogen heated to 250° C or higher for 10 hours or more. At such durations, the core and cladding of the fiber will reach the same temperature and no gradient will exist. In the present invention, a "burst" is used to achieve the gradient. The burst allows quick and momentary heating at the cladding, but the heat from the burst is not sustained nearly long enough for the core to achieve a temperature near that applied to the cladding. The temperature gradient causes excitation of the hydrogen atoms near the cladding, but those hydrogen atoms lose such excitation when they reach the cooler core and are thus disposed proximate to or within the core. This is made clear by amended claim 1, but not at all addressed by Carpenter.

Also, Carpenter teaches only exposing the fiber to heated hydrogen, claim 1 requires a burst of heated fluid (such as air or a inert gas). But Carpenter teaches away from using air (see col. 9, lines 6-35). Carpenter explicitly discusses removing all air from its chamber before introducing the pressurized hydrogen used for hydrogen loading the fiber. But of course, Carpenter is only concerned with hydrogen loading – not relocating hydrogen within an already hydrogen loaded fiber.

Each and every element of claim 1 is not taught by Carpenter, nor does Carpenter anticipate its independent claims 2-4 and 6. Removal of these rejections is requested.

Amended independent claims 7, 8, 17, 23, and 30 include the same or corresponding elements as those provided in claim 1. Thus, these claims are also not anticipated by Carpenter, nor are their respective dependent claims 9-11, 18-20 and 22, and 24-29. Removal of these rejections is requested.

Rejections Under 35 USC §102(e) to Atkins

The office action rejects claims 1-4 and 6-15 under 35 USC 102(e) as being anticipated US Patent 5,930,420 to Atkins ("Atkins").

Attachment 1 hereto provides a comparative summary of some of the many distinctions of the claim 1 over Atkins. Considering the many distinctions highlighted in the attachment

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between claim 1 and Atkins – it seems clear that Atkins does not disclose the “identical invention” or “each and every element” of claim 1. Specifically element B of claim 1 is discussed below.

Claim 1, Element B

B. relocating hydrogen atoms disposed within the optical fiber from the proximity of the cladding to the proximity of the core, said relocating comprising:

Atkins does not teach, identically and in complete detail as required for a rejection under §102, relocating hydrogen within a fiber that is already hydrogen loaded. Instead, Atkins is concerned with “activating” the hydrogen within a hydrogen loaded fiber – this is not the same as relocating the hydrogen (see col. 3). As is readily understood by those in the art, “activate” refers to the formation of hydroxyl flaws in the fiber and “relocate” refers to moving the H₂ within the fiber. It should be noted that the steps in Atkins are described and intended to achieve a different result than those of claim 1 - heat activation. Atkins does not teach or anticipate relocation. If any relocation occurs through Atkins’ laser heat activation (see, e.g., Block C of FIG. 1), it is apparently an unintended byproduct – since it is never mentioned in Atkins.

Claim 1, Element B, sub i)

i) generating a temperature gradient between the cladding and the core by applying at least one burst of a fluid heated to a temperature of at least about 100°C to the cladding of the at least one optical fiber.

Atkins does not teach, identically and in complete detail as required for a rejection under §102, generating a temperature gradient (particularly for relocating hydrogen within a hydrogen loaded fiber). Atkins never discusses generating a temperature gradient between the cladding and the core. Rather, Atkins teaches heating the entire fiber to 500° C or better and then rapidly cooling it to 100° C or lower. There is no need for creating a temperature gradient because Atkins is “activating”, i.e., creating hydroxyl flaws throughout the fiber. (see col. 3) Thus Atkins presumably is intending to teach heating (to activate) the hydrogen at the core. If the gradient of

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claim 1 were maintained, the hydrogen at the core would not reach the temperatures Atkins teaches for activation. Thus Atkins and the invention of claim 1 are inherently at odds.

Additionally, Atkins does not teach, identically and in complete detail as required for a rejection under §102, applying at least one burst of a fluid heated to a temperature of at least about 100°C. Rather, Atkins teaches using a CO₂ laser – not a fluid. Atkins teaches using 500°C or more, not 100°C or more. And Atkins does not teach a burst approach.

Each and every element of claim 1 is not taught by Atkins, nor does Atkins anticipate its independent claims 2-4 and 6. Removal of these rejections is requested.

Amended independent claims 7, 8, and 12, include the same or corresponding elements as those provided in claim 1. Thus, these claims are also not anticipated by Atkins, nor are their respective dependent claims 9-11 and 13-15. Removal of these rejections is requested.

Rejections Under 35 USC §103(a)

The office action rejects claims 5, 16, 21, 30 and 31 under 35 USC 103(a) as being obvious in view of Atkins, Carpenter or both.

Attachment 1 hereto provides a comparative summary of some of the many distinctions of the claim 1 over Atkins and Carpenter. Considering the many distinctions highlighted in the attachment between claim 1 and Atkins and Carpenter – it seems clear that these references, whether alone or in combination, do not make obvious the independent claims of the present invention, nor their respective dependent claims.

Claims 5, 16, and 21 are each dependent claims and their respective independent claims are patentable, discussed above. Thus claims 5, 16 and 21 are also patentable in view of these references.

Independent claim 30, as discussed above, is patentable in view of Carpenter, even when combined with Atkins. The combination of Atkins and Carpenter does not teach element C of claim 30, which relocates hydrogen in response to a temperature gradient generated between the cladding and core of the fiber – from a burst of heat. Accordingly, claim 30 is not made obvious in view of these references – neither of which teaches element C of this claim.

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Independent claim 31 was rejected for the same grounds as claim 30, and for the same reasons is not made obvious by Atkins and Carpenter. These references do not teach element C of claim 31.

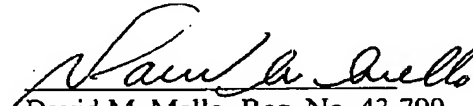
Thus for the reasons stated above with respect to each of Atkins and Carpenter these claims are not obvious in view thereof. Applicant respectfully requests removal of the rejections to claims 5, 16, 21, 30 and 31 under 35 USC 103(a).

Accordingly, Applicant requests withdrawal of the present rejections and allowance of the present application. Please charge any additional fees which may be due, or credit any overpayment, to Deposit Account Number 50-1133.

The Examiner is invited to telephone the undersigned attorney to discuss any aspect of this application or this response.

Respectfully submitted,

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